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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,480	10/25/2005	Jun Taniguchi	NAII124945	8460

26389	7590	12/18/2007
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EXAMINER	
AHMED, SHAMIM	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
12/18/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/528,480

Applicant(s)

TANIGUCHI, JUN

Examiner

Shamim Ahmed

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 18, 20-23, 39-41, 55 and 56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19, 24-38, 42-54 and 57-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/18/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I (claims 1-17, 19, 24-38, 41-54 and 57-60) in the reply filed on 10/19/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. It is noted that the withdrawn claims should be properly identified such as all the original withdrawn claims should be identified as "Withdrawn" and amended ones should be identified as "Withdrawn-currently amended".

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 5-7, 35 and 51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Regarding the above mentioned claims, the phrase "corroding the SOG-----" renders the claim indefinite because it is unclear how the etching is done just by corroding? Is there any subsequent step to remove the corroded portions?

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 6-7,9,11,13-15,25-29,33-35,42-43,47,50,57 are rejected under 35 U.S.C. 102(b) as being anticipated by Park (5,743,998).

Park teaches a process of transferring micro patterns using SOG resist media, wherein a surface of SOG layer (2) is irradiated with an electron beam to expose a portion (3) for altering the susceptibility of the portion of the SOG layer to etching (col.4, lines 42-49 and abstract); Park teaches that an intermediate layer (4) is formed in between the SOG and the sample substrate (6) of doped silicon wafer (col.6, lines 33-37); and the exposed region (3) is then removed by etching (col.6, lines 38-46 and figures 1A-1C).

As to claims 3 and 15, Park teaches the intensity of the beam is increased or accelerated depending on the beam position (col.8, lines 61-col.9, line 15).

Park also teaches that a plurality of layers including second SOG layers can be used and etching the intermediate layer and the substrate and as well as the remaining SOG layer (col.10, lines 21-60).

8. Claims 2, 6-9, 11,13-14,26,34,35,36,38,42-44,47 ,51-52,57 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyata et al (5,888,846).

Miyata et al teach a process for microfabricating diamond including the steps of irradiating a SOG of silicone (rubber) layer is disposed on an intermediate layer of resin (5), wherein the ion beam (7) is radiated on the SOG silicone layer and radiated portion is removed by etching (col.6, lines 10-24).

Miyata et al also teach that the remaining SOG layer and the intermediate and the diamond are etched (col.6, lines 32-44 and also see abstract).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3,4-5,16-17,45,46,48,49,58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al (5,888,846) in view of Hashimoto et al (5,169,494).

Miyata et al discusses above in the paragraph and teach that the resist is a general novolac resist (col.6, lines 3-7) but fails to teach the intermediate resin layer comprises PMMA.

However, in a fine patterning process, Hashimoto et al teach the use of organic polymeric resist material comprises PMMA to form the bottom resist layer (2) (col.5, lines 1-10 and col. 6, lines 49-52).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Hashimoto et al's teaching into Miyata et al's resin intermediate material because all of the materials are functionally equivalent and are well known to substitute with each other as taught by Hashimoto et al.

11. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al (5,888,846) in view of Sato (JP 05-315298 A).

Miyata et al discusses above in the paragraph 6 but remain silent regarding the ion beam comprises oxygen ion.

However, it is known to obtain resist pattern by using oxygen ion etching using SOG pattern as a mask as taught by the Sato.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ the teaching of the Japanese reference into teaching of Miyata et al for efficiently obtaining the resist pattern as suggested Sato.

12. Claims 30-32 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park in view of Miyata et al.

As to claims 31-32, Park teaches above in the paragraph 5 that multilayer of the SOG can be used and it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to expose the first and the second layer of SOG layer for forming the multilayer device as suggested by Park.

As to claim 37, park fail to teach the SOG is silicone rubber.

However, Miyata et al teach the use of silicone SOG having excellent stability with time (col.4, lines 49-58).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Miyata et al's teaching into Park's process by

incorporating the silicone (rubber) SOG for excellent stability with time as suggested by Miyata et al.

13. Claims 10, 12 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al (5,888,846) in view of Applicant's admission.

Miyata et al discusses above in the paragraph but remain silent regarding the recess is formed by molding.

However, Applicant admits that it is known in the lithographic art that a mold is pressed in the curable resin in this case SOG layer and the mold is released to form pattern or recess or protrusions in the SOG layer (see the specification page 1, last paragraph).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to modify Miyata et al's process with the conventional process for easily forming pattern in the SOG layer as suggested by Applicant's admission.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Johnson et al (3,808,068) teach a process of ion implanting a selective portion on a single crystal for altering or corroding the portion that can be easily remove by etching to form recess and/or protrusion on the crystal substrate; Liu et al (6,444,136) teach a process of irradiating a surface with e-beam and then the irradiated portion is easily removed by etching.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-

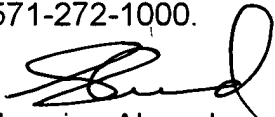
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1457. The examiner can normally be reached on Tu-Fri (12:30-10:30) Every Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Shamim Ahmed  
Primary Examiner  
Art Unit 1792

SA  
December 12, 2007